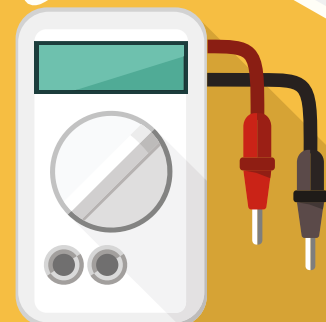




CHAPTER 10

BUILDING STRUCTURE

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Chapter 10: Building Structure

1. Introduction

The primary purpose of the building structure is to protect ingredients, the processing equipment and food products. Ideally, it should not impose constraints on the process or layout of the production facility. Good sanitary design plus good installation, maintenance and cleaning makes maximum efficiency possible.

The provision of hygienic facilities is governed by legislation. The Regulations Governing General Hygiene Requirements for Food Premises and the Transport of Food, R 962 of 23 November 2012, (Foodstuffs, Cosmetics and Disinfectant Act, Act 54 of 1972) provides for the issue of a Certificate of Acceptability prior to the commencement of food processing.

It must be noted that an unsuitable location has product and cost implications throughout the working life of a processing facility. Physical factors linked with products such as water supply, waste disposal and energy supply should be carefully considered. It is the responsibility of every processor to make him-/herself fully conversant with the content of the said regulation and standards such as the SANS 10049 (food safety management systems – requirements for prerequisite programmes) to ensure compliance.



This chapter provides guidelines on the choice of premises, equipment and utilities such as water and air. It also addresses pest control and the management of waste. Maintenance programmes are discussed, including the control of foreign material contamination sources such as glass and plastic. This chapter must be read in conjunction with Chapters 4, 5 and 9 that also touch on the relevant aspects of the building structure.

2. Requirements for food premises

2.1 Certificate of acceptability for food premises



It is illegal to trade without a valid Certificate of Acceptability. This certificate is issued after an inspection of the facility by the local environmental health practitioner.

R 962, 3

SANS 10049, 4

SANS 1678, 5.1

SANS 1679, 5.1

Chapter 4, 5, 9

R 962, 3

SANS 10049, 4

SANS 1678, 5.1

SANS 1679, 5.1

The aim of the inspection is to ascertain if the dairy processing facility is of such location, design, construction and finish that it does not constitute a public health concern.

The regulation defines the requirements for finishes, ventilation, lighting, toilet facilities, hand-washing and wash-up facilities. There are also requirements for chillers of dairy products and temperature-measuring equipment.

These are the minimum requirements a dairy processor should comply with.

2.2 Construction, layout and conditions of the dairy processing facility

A dairy processing facility should be located in a manner that the surroundings do not pose a threat of contamination. Such a threat may come from dust, pollution or odours from neighbouring activities.

The facility should be fenced and well drained to ensure that no stagnant water is in the immediate vicinity. Security measures shall be in place to prevent unauthorised access to the facility. Driveways should preferably have a solid surface to minimise dust and mud.



The yard should be clean and tidy at all times and the storage of outside items controlled to prevent pest harbourage. Ideally items should be stored on racks or pallets in clearly defined areas. The gardens should also be maintained for this reason.

Unused buildings must be kept clean to prevent rodents and birds from breeding there.

The buildings must be built in a way to protect the product and process and must be well maintained. This includes the requirement of being weatherproof, dustproof and pestproof. There should be enough space for all activities and the flow and layout must ensure that contamination and cross-contamination is prevented and at the very least minimised.

R 962, 5(2)

SANS 10049, 7.2.1.1

SANS ISO TS 22002-1, 4.2

SANS 1678, 5.2

SANS 1679, 5.2

CGCSA FSI GMCP B.B. 2.1

SANS 10049, 7.2.1.3

SANS ISO TS 22002-1, 4.3

SANS 1678, 5.2.3

SANS 1679, 5.2.3

CGCSA FSI GMCP B.B. 2.1

R 962, 10

SANS 10049, 7.2.1.3

SANS ISO TS 22002-1, 4.3

SANS 1678, 5.2.3

SANS 1679, 5.2.3

CGCSA FSI GMCP B.B.2.6

SANS 10049, 7.2.1.2, 7.2.10

SANS ISO TS 22002-1, 4.1, 5.2

SANS 1678, 5.2.2, 6.8

SANS 1679, 5.2.2, 6.8

CGCSA FSI GMCP B.B.

2.1, B.C.1

Where products are handled after pasteurisation, additional precautions are required, particularly when handling high-risk products.

Roof valleys and gutters should be inspected regularly.

There should be sufficient facilities for separate storage areas for edible ingredients, packaging, cleaning, utensils, ablutions and waste. Refer to Chapters 4 and 5 for details of storage practices.

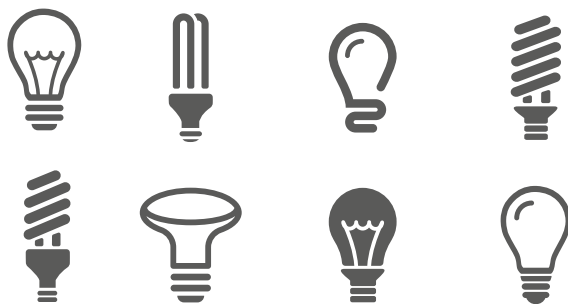
Interior wall surfaces should be smooth and easy to clean. Openings in walls should be sealed at all times. Ideally the junctions between wall and floor surfaces should be covered to assist with cleaning. The preferred finish is “iso-walling”. Tiles can be problematic due to breakages or porosity. Walls should be protected from damage by moving equipment.

Sufficient washbasins are required at each entrance to the facility. Appropriate ablution facilities are required as described in Chapter 8.

Doors should be tight-fitting and ideally self-closing or provided with a lobby and air curtains.

Floors should be smooth and easy to clean with an appropriate slope for adequate drainage. Drains should not pose any threat of contamination. Floors should be laid by professionals that specialise in the food industry as they represent a considerable investment and can be problematic if preparation is not correct.

Adequate lighting must be provided and lights should be protected. Windows are not recommended due to breakage, but if present, should be fitted with removable cleanable fly screens.



SANS 10049, 7.2.1.9, 7.2.10
SANS ISO TS 22002-1, 10.2
CGCSA FSI GMCP B.B. 2.1, B.C.1.4

SANS 10049, 7.2.2
SANS ISO TS 22002-1, 14.2
CGCSA FSI GMCP B.B. 2.2

R 962, 8
SANS 10049, 7.2.10, 7.2.11
SANS ISO TS 22002-1, 5.7
SANS 1678, 5.9
SANS 1679, 5.9
CGCSA FSI GMCP I.B.4.1
Chapter 4, 5

R 962, 5(3) a
SANS 10049, 7.2.3
SANS ISO TS 22002-1, 14.2
SANS 1678, 5.3.1
SANS 1679, 5.3.1
CGCSA FSI GMCP B.B.2.2

R 962, 5(3) c
SANS 10049, 7.2.8,
SANS ISO TS 22002-1, 5.3
SANS 1678, 5.13
SANS 1679, 5.13
CGCSA FSI GMCP I.B.2
Chapter 8

SANS 10049, 7.2.3
SANS ISO TS 22002-1, 5.3
SANS 1678, 5.3.2
SANS 1679, 5.3.2
CGCSA FSI GMCP B.B.2.1

SANS 10049, 7.2.4,
SANS ISO TS 22002-1, 5.3
SANS 1678, 5.3.3
SANS 1679, 5.3.3
CGCSA FSI GMCP B.B.2.1

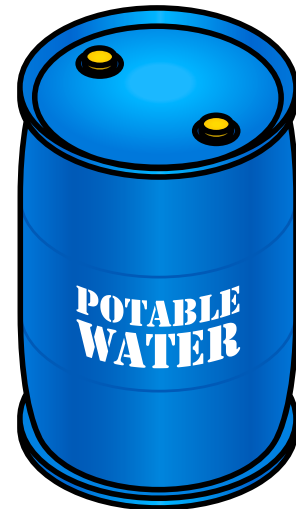
R 962, 5(3) b
SANS 10049, 7.2.6
SANS ISO TS 22002-1, 6.6
SANS 1678, 5.5
SANS 1679, 5.5
CGCSA FSI GMCP B.B.2.3

R 962, 5(3) d
SANS 10049, 7.4.1
SANS ISO TS 22002-1, 6
SANS 1678, 5.10
SANS 1679, 5.10
SANS 241
CGCSA FSI GMCP B.B.6

3. Water, ventilation, air quality, steam, plant and equipment

3.1 Water

Potable water used in the factory shall comply with SANS 241 according to legislation. The amount of potable water available must be appropriate to meet the requirements. Ice, used during processing, should be made from potable water and should be stored and used in such a way as to prevent possible contamination.



If the potable water distribution network includes a chlorination unit, the latter should be equipped with an automatic alarm system, which is both visible and audible, signals malfunctions and permits repairs.

Reservoirs should be kept in perfect condition and regularly cleaned according to a specific schedule.

The responsible person should conduct regular water quality tests to ensure compliance.

For this purpose, a control programme shall be established and carried out for microbiological and chemical analyses.

The programme should include the following aspects:

Frequency

- a. Microbiological analyses:
 - Monthly, if water is from a private well.
 - Annually, if water is from a public source.
- b. Chemical analyses:
 - Annually.

Analyses to perform

- a. Microbiological analyses:
 - Total coliforms.
 - Faecal coliforms.
 - Faecal streptococci.
 - Sulphide reducing clostridia.
 - Total bacterial count at 36°C and 22°C.
- b. Chemical analyses:

Limited to the most significant substances in relation to the water source and characteristics of the internal network of pipes, to be agreed on with the local authority. SABS 241 should be used.



Sampling

Sampling should always be carried out at different points inside the factory to ensure a representative picture and a progressive total control of the water distribution network.

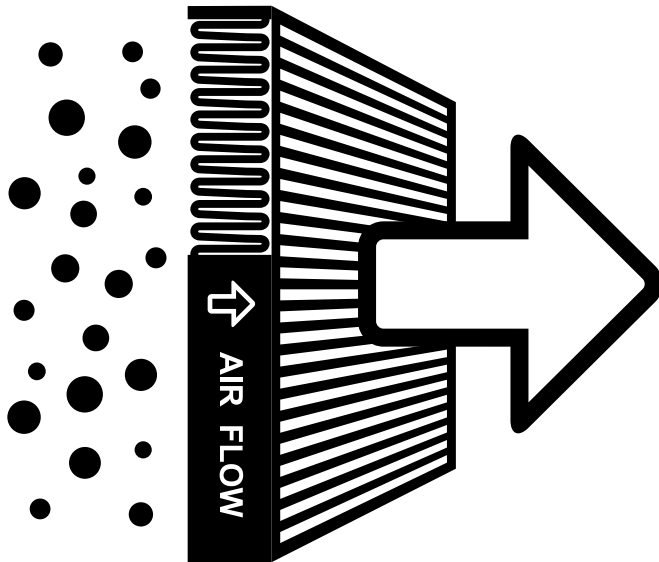
The responsible person should draw up a plan of the network, numbering the water distribution points. The number corresponding to the sampled distribution point should appear on the sampling form.

If the analyses indicate potential hazards to food safety, the local authority must be informed and the water should not be used.

Hosepipes should be managed properly.

3.2 Ventilation and air quality

Ventilation systems in the processing facility must ensure that there is adequate circulation of air in order to prevent the build-up of condensation and growth of mould.



The air used for ventilation must be free from contamination. Additional filter systems may be required.

Air flow must be from the most hygienic areas to less hygienic areas.

Air used for direct product contact or packaging must be appropriately filtered.

3.3 Compressed air and gas

These should be food grade and filtered to ensure no contamination takes place.

3.4 Steam

Steam that comes into direct contact with food, food contact surfaces or water shall be produced from potable water and shall not contain substances that might be hazardous to health or might contaminate the food. Steam shall only contain additives that are permitted for use by law or good manufacturing practice and the total solids in the boiler shall be so controlled as to avoid boiler solids being carried over. Boilers shall be properly operated and maintained.

Steam that will be in direct contact with the products should be obtained from potable water and should not contain any chemical substances harmful to health or contaminating the product. The pipes of distribution networks of potable water and steam that will be in direct contact with raw materials, intermediate products and end products should be constructed of a non-toxic material and be resistant to corrosion.

R 962, 5(3) b

SANS 10049, 7.2.7, 7.4.2

SANS ISO TS 22002-1, 6.4

SANS 1678, 5.11

SANS 1679, 5.11

CGCSA FSI GMCP B.B. 2.1

SANS 10049, 7.4.3

SANS ISO TS 22002-1, 6.5

SANS 1678, 5.11

SANS 1679, 5.11

SANS 10049, 7.4.1

SANS ISO TS 22002-1, 6.3

SANS 1678, 5.10.2

SANS 1679, 5.10.2

CGCSA FSI GMCP B.B.6

SANS 1678, 5.10.2

SANS 1679, 5.10.2

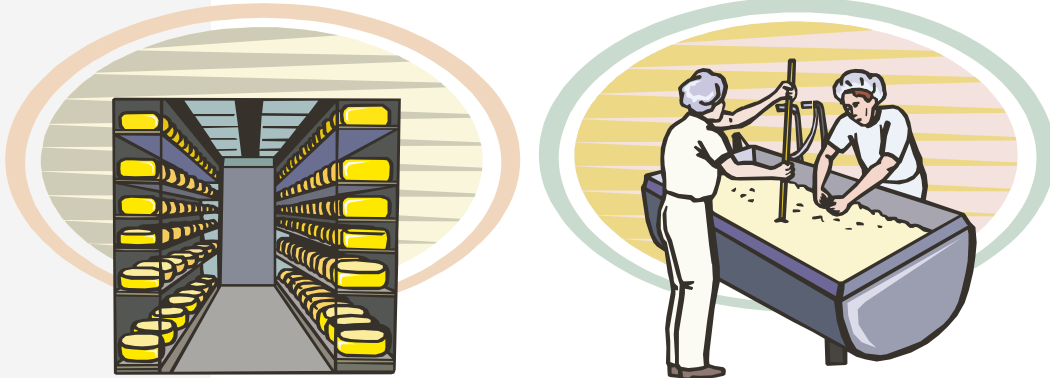
SANS ISO TS 22002-1, 6.3

CGCSA FSI GMCP B.B.6

R 962, 6
SANS 10049, 7.3
SANS ISO TS 22002-1, 5.4, 8
SANS 1678, 5.8
SANS 1679, 5.8
CGCSA FSI GMCP B.B.
2.4-2.5

4. Plant and equipment

All equipment that comes into contact with products must be smooth, corrosion-resistant and non-absorbent. Equipment should be easy to clean and should be designed to minimise the possibility of contamination.



The plant and equipment must be positioned to enable effective cleaning.

Conveyors lubricated with soap for packaging materials and gearboxes that may leak into products should be fitted with drip trays to minimise contamination.

Plant services should not interrupt smooth wall surfaces and all cables should be in trunking that does not pose a threat of pest infestation.

Cladding used for pipe work should be suitable for a food facility and should be maintained in good repair.

5. Waste

Refuse materials should be handled in such a way that it does not create a contamination risk for products.

Refuse material from the production process (solid waste and residues) inside production areas should be kept in suitable containers that are clearly identified, to prevent them from being confused with those containing products or other raw ingredients.

These containers should be removed and cleaned and cleared as frequently as possible, but at least once a day. They should be easy to handle, clean and disinfect. Waste bins used for waste generated during production must be lined with disposable liners and have no lids. Outside containers must have disposable liners and have lids.

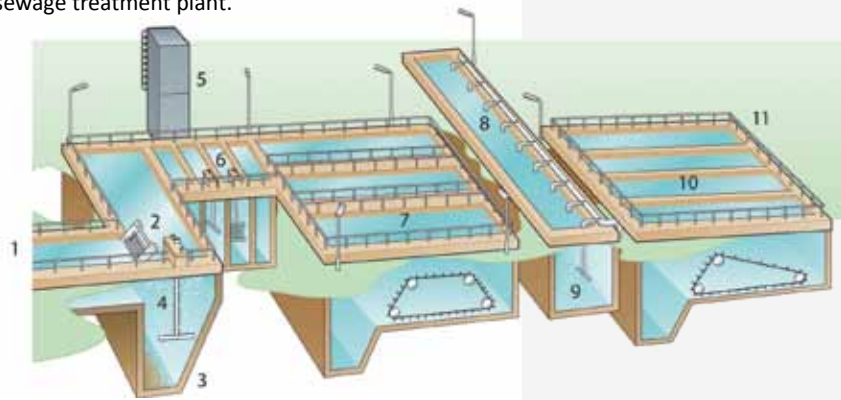
Liquid processing residues should be collected and hygienically conveyed toward suitable tanks. It is important to ensure that liquid waste is not an environmental contaminant and the correct effluent permits are obtained.

R 962, 5(3) d, 10
SANS 10049, 7.2.15,
SANS ISO TS 22002-1, 7
SANS 1678, 5.12
SANS 1679, 5.12
CGCSA FSI GMCP I.B.3

R 962, 5(3) d, 10
SANS 10049, 7.2.4
SANS ISO TS 22002-1, 7
SANS 1678, 5.12
SANS 1679, 5.12
CGCSA FSI GMCP I.B.3

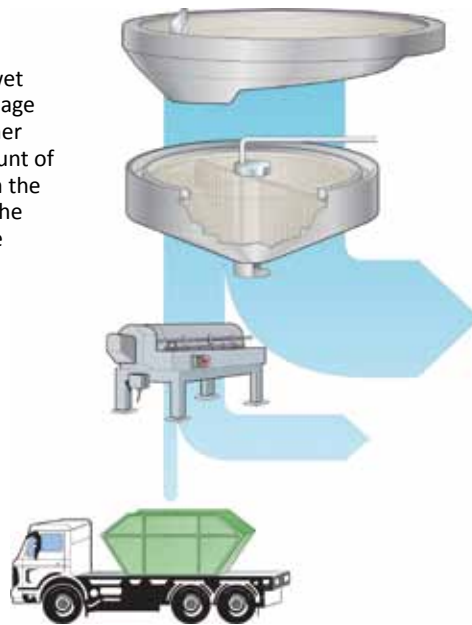
Figure 1: The various stages of a sewage treatment plant.

- 1 Inlet channel
- 2 Grid
- 3 Sand trap
- 4 Aeration
- 5 Silo for flocculant
- 6 Pre-precipitation
- 7 Pre-sedimentation
- 8 Biological treatment
- 9 Aeration
- 10 Post-sedimentation
- 11 Clarified effluent to recipient



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Figure 2: Reduction in volume of wet sludge from the primary settling stage after treatment in a sludge thickener and decanter centrifuge. The amount of dewatered sludge discharged from the decanter centrifuge is only 8% of the volume of the wet sludge from the sedimentation basins.



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Processing residues, destined to be reprocessed for production of food for human consumption, should be regarded as raw materials. Those destined for other purposes should be stored in well-identified areas.

Waste disposal areas should be placed as far as possible from processing areas and from ventilation systems to avoid cross-contamination. The area should be clean and odourless.

As environmental management of dairy wastes becomes an ever-increasing concern, treatment strategies will need to be based on local and other regulations. It is thus essential that environmental management becomes a common activity of all dairy processing plants.

Vehicles used to transport waste from processing areas to collection tanks should be cleaned and disinfected.

During transportation, waste should not touch/contaminate food products.

It is essential that particular care should be taken with respect to pest control in waste collection areas.

- SANS 10049, 7.2.15
- SANS ISO TS 22002-1, 7
- SANS 1678, 6.5
- SANS 1679, 6.5
- CGCSA FSI GMCP B.B.2.6

R 962, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12
SANS 1678, 6.4
SANS 1679, 6.4
CGCSA FSI GMCP B.B.5

R 962, 10 (i)
SANS 10049, 7.4.8, 7.2.1.3

R 962, 5(3) c
SANS 10049, 7.2.1.7
SANS ISO TS 22002-1, 12.1
SANS 1678, 6.4
SANS 1679, 6.4
CGCSA FSI GMCP B.B. 5

SANS 10049, 7.2.3.9-7.2.3.11
SANS ISO TS 22002-1, 12.3

SANS ISO TS 22002-1, 12.4

R 962, 5(3) d, 10
SANS 10049, 7.2.15
SANS ISO TS 22002-1, 12.4
CGCSA FSI GMCP B.A.2.3

6. Pest prevention

Pests are a serious hazard for food hygiene and safety. Since infestation can readily take place under conditions suited to their reproduction, e.g. nourishing substances, general hygiene practices have to be developed to prevent the creation of such a suitable environment.

In addition to a contract with a pest control/prevention company, an audit system should be developed to provide independent confirmation that the contractor is delivering what has been agreed on and also that effective pest control is being achieved. A responsible person must be appointed on site to liaise between the processor and the contractor. Staff members must report all incidents regarding pest sightings to him.

It is a legal requirement to ensure that the facility is pest-free.

Pests include pets.

6.1 Pest control

6.1.1 Prevention of infestation

Buildings should be kept well maintained to prevent access of animals and eliminate possible locations for their reproduction. Holes, canalisations and other ways through which animals could enter have to be sealed meticulously.



The following measures must also be taken:

- All doors leading to the exterior should close perfectly and possibly be operated automatically (hydraulic arm, spring pillars, photocell, etc.) to prevent rodents and crawling insects from entering. Where this is not possible, there must be clear indications of the duty to keep doors closed, or automatic door closers should be installed. All exterior doors are to be fitted with overlapping plastic curtain strips to prevent flying insects and birds from entering the plant.
- All windows towards the exterior that can open should be equipped with a removable and washable protective fly screen.
- All external openings that can allow entry of any insect, rodent, bird or other creature should be adequately sealed with a suitable sealant. All pipes of the facilities should be protected to avoid entry by animals and insects.

6.1.2 Elimination of refuge

Inside the buildings all potential refuge for pests, such as holes and crevices in walls and floors, obsolete material and equipment, etc. must be eliminated. Other elements such as electrical panels, routes for pipes and cables between adjacent premises should be sealed.

The presence of food and water attracts pests and permits their reproduction. Therefore, nourishing substances and waste must not be left uncovered and stagnant water must be avoided; potential foods for pests should be stored inside appropriate containers raised from the floor and not against walls.

The materials in the premises should not be stored against the walls to facilitate cleaning operations, hygiene and pest inspections. Minimum clearance should be 500 mm between walls and packed material as well as 300 mm off the floor and on pallets or metal racks.

6.2 Guidelines and recommendations

6.2.1 Standards for pest control/prevention programmes

The elected pest control/prevention supplier must ensure that the following information is available in the pest control file:

- Policy statement of the pest control company.
- Emergency response numbers of pest control contractor, nearest hospital and poison centres.
- Detailed breakdown of the type of service that will be provided, contract, the programme specifications and the service schedule for the year.
- Public liability insurance declaration and workman's compensation details. Valid current copy of the registration certificate(s) of the assigned technician(s) with the Department of Agriculture (permanent or temporary registration number).
- Factory/premises layout, showing placement and numbering of rodent stations, insect monitors, traps, insect light traps, (bait map), etc.
- Monitoring and sighting logs, on which critical points and monitoring devices are recorded.
- Service and corrective action reports.
- Action reports.
- Pesticide usage log.
- Material safety data sheets with the relevant product labels that include the directions for use.
- Quarterly in-depth reports.
- Checklists, including receiving practices to prevent contaminated stock from entering the facility. Standard operating procedures and checklists must be provided by the processor.
- Programme specifications and the service schedule for an entire year.
- Environmental commitment policy (certificate when sanitation and waste is removed by the pest control contractor, sanitation items need to be incinerated).

6.2.2 Considerations for selecting a pest control subcontractor

- All contractors must comply with relevant legislation requirements and standards.
- Technicians performing services at food premises must have P/T certificates. The P and T numbers must be renewed yearly as required by the Department of Agriculture.
- Should a programme include fumigation, the contractor must have a registration certificate for industrial fumigation. Always clean after fumigation to preclude foreign bodies from being present.
- Insecticides and rodenticides must be environmentally acceptable and registered for South African use. Such registration is indicated by the L number on the product.
- The company should have a certificate of compliance for the Compensation for Occupational Injuries and Diseases Act 1993, to cover the pest control operator. The customer must have his/her own contract.
- The company shall have a policy to follow an ecologically or environmentally sensitive programme.
- Public liability should cover the customer's personnel as well, in case of serious situations.

R 962, 5(3) d, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12.2, 12.5
CGCSA FSI GMCP B.B.5

R 962, 5(3) d, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12.2, 12.5
SANS 1678, 6.4
SANS 1679, 6.4
CGCSA FSI GMCP B.B.5

- Have a track record of servicing the food processing industry.
- Be able to train staff in the food industry, regarding the following:
 - Contamination and risks related to pest prevention.
 - Recording of pest sightings.
 - Advice on hygiene, housekeeping standards, which could reduce the risk of pests.
 - Pest control awareness training regarding the importance of pest control in food production.
- The technician from the pest control company will comply with the dress code, code of conduct and personal hygiene code of the food production company.

The contract should include:

- Pest control/prevention contractor's agreement for the specific site.
- Monthly service programme (maximum six weeks where infestation is low). Two inspections should be carried out at night by a qualified pest control operator and two audits during the day. Night inspections should be carried out after production and cleaning has been completed.
- Emergency call-out service. The pest control company must respond within 24 hours.
- Special service conditions, e.g. fly infestation.
- Follow-up on infestation adequate.

! In-house/self-administered pest prevention/control is NOT recommended.

Only a current and registered pest control operator, registered with the Department of Agriculture, may render a pest control service in a food establishment. In the event of a company employing a registered pest control operator, such operator shall be deemed competent by the Department of Agriculture responsible for the certification of pest control operators (Act 36 of 1947).

In cases where it is only possible to carry out an in-house programme, additional evidence will be required to demonstrate the effectiveness of the system.

All actions must be:

- Documented.
- Show control of the system.
- Must be visited by a qualified person who will do monthly inspections and issue reports.
- Show the cost of the two systems to prove why the relevant one was chosen.
- The in-house system must comply with the requirements above.

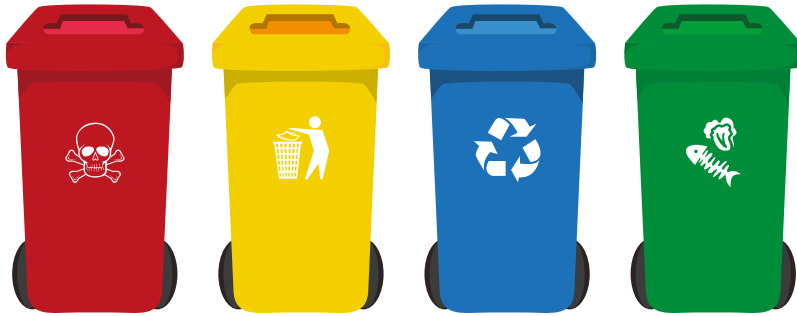
6.2.3 Pest control chemicals

- Do not use:
 - Household applications.
 - Sticky paper as insect traps.
- For organic pest control:
 - No chemical application or treatment is allowed, only non-chemical devices e.g. pest monitoring boards, fly units and catch traps may be used.
 - Good housekeeping and hygiene practices should be implemented for the safe handling of pest control chemicals.
 - No pest control chemicals may be stored on site if an external contractor is doing the service. The client/staff should not have any contact with the chemicals.

R 962, 5(3) d, 10
 SANS 10049, 7.4.8
 SANS ISO TS 22002-1, 12.6
 SANS 1678, 6.4
 SANS 1679, 6.4
 CGCSA FSI GMCP B.B.5

6.3 Waste and pests

- a. Keep waste areas clean, internally and externally. These areas must be included in the master cleaning schedule.
- b. Remove waste often and record such removal.
- c. External waste areas need to be as far as possible from the production area and preferably downwind.
- d. Waste emitting bad odours will attract flies. Seal such waste in plastic before dumping.



6.4 Sensitive areas

A decision should be made as to which areas are considered to be sensitive, non-sensitive and non-food areas. Indications of dead insects, droppings of birds or rodents, etc., may be used to identify high risk/sensitive areas. The programme should be adapted accordingly.

- a. Sensitive areas will include the following:
 - Where raw materials are off-loaded and stored.
 - Where food and packaging materials are handled.
 - Production areas.
 - Packaging areas.
 - Cold storage and stores.
 - Areas surrounding or close to any of the above.
- b. Non-sensitive areas would be maintenance areas, workshops, staff facilities and stores for obsolete equipment.

6.5 Treating crawling insects (cockroaches, ants, etc.)

- Non-residual contact insecticides are allowed (no household applications).
- For cracks and crevices, residual contact insecticides may be used, provided there is no possibility of their coming into contact with food.
- Procedures must be explained to the facility manager. Packaging material and food must be removed before application of pesticides.
- After treatment the area must be washed under supervision.
- Cracks and crevices must be sealed after treatment, but only when the infestation has been eliminated.
- If insect monitors are used, the pest control technician will inspect these during each visit. If activity is noticed, follow-up visits will be done weekly (every seven days), until two consecutive clear days are noted.
- Control infestation.
- Identify type of insect.
- Locate harbourage and area of activity.
- Clean area, equipment and remove food debris.
- Treat harbourage areas (protect food and equipment).

R 962, 10
SANS 10049, 7.2.15
SANS ISO TS 22002-1, 12.4

R 962, 5(3) d, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12.6

- Spraying or fogging may be done in non-sensitive areas, e.g. maintenance, workshops, staff facilities and stores. It can only be done when:
 - Severe infestation takes place.
 - The manager understands the application and implication of this.
 - No production of packaging is in progress.
 - No food or packaging material is present.
 - The facility and equipment are washed down after treatment and this is done under strict supervision.



Fogging

The type of fogging must be confirmed. There are two types, hot and cold fog. Most buildings in South Africa are designed to keep hot fog inside and therefore it is more effective to use cold fog (ultra-low volume). The only time the Fire Department must be informed is when hot fog is to be used.

6.6 Treating flying insects (flies, moths, stored product insects (SPI's) etc.)

These are best controlled by exclusion; ensuring that all holes are sealed, keeping doors closed and/or all doors are fitted with overlapping plastic curtaining strips, all air vents, windows that can open are fitted with fly screening (e.g. stainless steel fly screens of No 16 mesh, 1,2 mm gap) and by sanitising.

There are many insect control device models on the market, e.g. glue boards and the shocking type. Each type has its place in the market. It is best to consult the manufacturers and then compare specifications before making a purchase. The cost of hiring versus buying must also be considered.

During the installation of insect control devices consider the following:

- May not be within 3 m from the food preparation area (and any product contact surfaces and packaging).
- Units must not be visible from the outside as it will attract insects from the outside during the night.
- Avoid purchasing and installing Insect control devices such as glueboards and electric fly killers without a service contract. Get the advice of a qualified pest control company.
- Ensure the instrument has the correct capacity and efficiency and install the required number of units accordingly. Get the advice of a qualified pest control company.
- Place these on critical pathways, e.g. entrances, production areas, windows, etc. Get the advice of a qualified pest control company.
- Insect light traps (ILT's) are ineffective in direct sunlight, when placed higher than 2,8 m.
- Use glue board type units, with louvres/safety grids in processing areas.
- Use shatterproof or plastic sleeve-coated tubes in processing areas.
- All ILT's must have an inspection sticker to record services, replacements and pest control officer details.
- All ILT's are to be numbered and shown on the site plan.
- Cleaning of units, fly species identification and fly species count should preferably be done by the contractor.
- If the facility layout changes, re-evaluate the positioning of the units.

R 962, 5(3) d, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12.6
CGCSA FSI GMCP B.B 5

R 962, 5(3) d, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12.6
CGCSA FSI GMCP B.B.5

- When using an electric fly killer (EFK) the following aspects are important:
 - The unit must have a wider catch tray than the width of the outer frame of the unit.
 - Ensure that the units are not visible from the outside of the facility as this will attract insects from the outside to the inside of the facility at night.
 - Only use these in non-sensitive areas.

If these are part of a service contract, the contract should include the following:

- Flying insect identification.
- A count per species.
- Monthly replacement of board.
- Cleaning and sterilising of the unit.
- Replacement of fluorescent tubes once a year.

! NO MIST UNITS ARE PERMITTED.

These units can contaminate products with their spray, which drifts as the insecticides are sprayed at controlled intervals. It is also a human irritant.

Other best practice activities include:

- Prevent infestation and breeding in production areas by holding daily inspections.
- Breeding in stores should be prevented by daily cleaning of equipment, machinery and structures.
- It is important to ensure that finished products are uncontaminated.
- Insecticide to be used must be for stored product insect (SPI)-use and the necessary precautions must be in place when trained and qualified persons apply it. SPI measures are used for existing infestations.
- The use of pheromones must be considered to determine whether a problem exists and in which areas. Only then must insecticide be applied.
- Under certain circumstances, residual insecticides can be used to kill larvae developing from insect eggs.
- Food material and working surfaces should be covered to minimise exposure.
- Destroy any food that might have been contaminated in the process immediately.
- Contaminated work surfaces must be thoroughly cleaned before use.
- Areas that were treated must be cleaned before and after treatments.
- Fumigation of infected stock or cheese maturing rooms is also an option, but only licensed fumigators can do this kind of work. The chemicals used must be correctly calculated and the entire area cleared of staff for the period of fumigation. Before this is considered it must be decided whether the product can be used or must be destroyed. If the product can be destroyed then do not fumigate as it is a waste of money.
- Supplier quality assurance is also a major part of any pest control programme. Raw material deliveries shall be inspected for pest infestation.



6.7 Rodents (mice, rats etc.)

6.7.1 Inside

- a. No feeding stations are allowed in any area of a food premises.
- b. Limit the use of glue boards and mechanical traps. If glue boards are used, more regular inspections are required. (For humane reasons this practice is not encouraged.)
- c. In the event of identifying an infestation inside the plant the following procedure need to be followed:
 - Try to eradicate the infestation by using non-chemical devices, e.g. glue traps, catch traps etc.
- d. If there is no success, only then could rodenticides be considered under the following controlled and monitored conditions:
 - Bait stations to be placed after production hours and to be removed before the start of production the next day.
 - Before production starts, management must ensure that no spillages have occurred during the evening.
 - Temporary bait stations are to be included in the plan of the factory.



6.7.2 Outside

- a. Traps must be shown on the facility layout and must be inspected daily (by the responsible person on site). No evidence of decomposing rodents must be visible. The pest control contractor is responsible for the removal of dead or decomposed rodents, where visible.
 - Bait stations must be numerically identified and labelled with the following information:
 - Company name and telephone numbers.
 - Warning information (in three languages).
 - Poison used registration number "L".
 - Active ingredient.
 - Antidote.
 - Indicated on the factory layout.
 - Have a number on the box, corresponding with a plaque above it.
 - Have an inspection sticker inside the lid, containing dates of services and pest control officer information.
- b. Tamper-resistant boxes must be used and must show current labels. Bait boxes must:
 - Have a lockable access lid that seals properly and can only be opened with a unique key. The responsible trained person on site must have a key to these stations.
 - Have a rodent entry point big enough to allow entry only to rodents.
 - Be strong enough to prevent pests entering doing damage.
 - Have bait secured by rods.
 - Have fresh and securely fitted bait; wax blocks are the preferred bait.
 - NOT HAVE CLEAR LIDS! The bait stations with clear lids do not attract rodents. Rodents like dark places where they can hide and not be seen and/or be disturbed by passing traffic.
 - NOT HAVE LIQUID/GRAIN/LOOSE BAIT!
- c. When attending to follow-up visits, all areas adjacent to the infestation must be inspected.

- d. NO CARDBOARD BAIT STATIONS ARE ALLOWED ANYWHERE, NOT EVEN IN OFFICES!
- e. When placing bait stations the following should be considered:
- Layout of the site.
 - Location of the site.
 - Neighbours.
 - Environment.
 - Building setup/condition.
- f. All external doors shall be rodentproof; no gaps more than 6 mm. Bristle strips can be used to render doors rodentproof.
- g. It is recommended that bait stations be placed ± 30 meters apart (exterior). However, the pest control company must be able to indicate why it chose to place bait stations at certain intervals through trends and historical data.
- h. Place bait stations on either side of any entrance/exit and thereafter ± 20 metres apart. In a high-risk area bait should be placed closer together.

6.8 Controlling birds in food premises

The following considerations are important for the prevention of bird infestations:

- All birds must be prevented and discouraged from roosting or entering the facility.
- Limit spillages and maintain high standards of hygiene.
- All external doors must be closed and/or fitted with plastic overlapping curtains.
- Bird-proof doors, fitted with wire mesh.
- Close all holes in the structure; air vents are to be screened with bird netting with a hole size of 13 mm or smaller.
- Advise your contractor on the control of birds when for example close to a landfill site, where it can cause problems in your facility.
- Install strategic placements, e.g. spikes, netting, etc.
- Remove all nesting material and debris regularly.
- Inspect outside and inside structures regularly for nests and breeding places.

7. Maintenance

7.1 Buildings and grounds (inside and outside)

Buildings, structures, equipment and facilities must be kept in a well-maintained condition in order to:

- Facilitate cleaning and disinfection procedures.
- Operate properly, particularly at critical points.
- Prevent contamination from physical, chemical and biological agents.

7.2 Equipment

A planned preventative maintenance programme for all equipment must be available, including frequency of service, replacement of parts, predicted next service as well as the person responsible for the maintenance programme.



The manufacturer/supplier should be consulted on the recommended cleaning and maintenance procedures, including frequency and products to be used for cleaning and maintenance.

After a maintenance intervention, it is necessary to restore hygienic conditions by adequate and where prescribed, documented procedures for cleaning and disinfection

R 962, 5(3) d, 10
SANS 10049, 7.4.8
SANS ISO TS 22002-1, 12.6
CGCSA FSI GMCP B.B 5

R 962, 10
SANS 10049, 8.8
SANS ISO TS 22002-1, 4.1
SANS 1678, 6.7
SANS 1679, 6.7
CGCSA FSI GMCP I.B.1

R 962, 10
SANS 10049, 7.3.2
SANS ISO TS 22002-1, 8.6
CGCSA FSI GMCP I.B.1

before production restarts. Maintenance staff and external contractors must be aware of company hygiene standards; they must adhere to the company's hygiene code of conduct and must also be trained accordingly.

- Toolboxes must be cleanable and mobile.
- Tools must be disinfected before and after maintenance.
- A list of tools must be available in tool boxes.
- Tools must be counted before and after maintenance work.
- Records must be kept of the responsible person who carried out the maintenance.
- Only food grade lubricants should be used on equipment that comes into contact with food.

Maintenance can assist in the control of foreign bodies, e.g. welding rods, cable ties, nuts, bolts etc. Maintenance staff must be trained in the policies of the company and requirements to meet food safety standards.

7.3 Instruments

Measuring devices used to carry out controls in the quality control programme (pH meters, thermometers, scales, etc.) must be periodically controlled and calibrated.

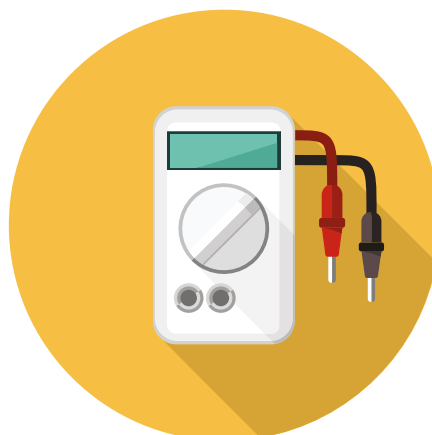
Instruments to be calibrated must be identified and numbered. External calibrations must be accompanied by a certificate from an accredited company capable of carrying out the calibration.

The frequency of verification of calibration with records and corrective actions must be available.

Guidelines for instrument calibration

Instrument	Verification	Calibration
Thermometers	Monthly	Yearly
Scales	Daily	Yearly
pH meters	Daily	
Certificates of pasteurisers		Yearly
Metal detectors	Sensitivity checks	Daily

! Actual calibration readings are to be recorded with corrections.



R 962, 6(5)
 SANS 10049, 7.3.3
 SANS ISO TS 22002-1, 8.6
 SANS ISO 22000, 8.3
 CGCSA FSI GMCP I.A.5

8. Plastic and foreign material control

8.1 Prevention of contamination by glass

A written policy statement is required stating the objectives of control in the facility.

Components situated directly on processing equipment e.g. "sight" must be replaced where possible with suitable alternative materials, e.g. thermoplastic, polycarbonate or metal.

Any glass in production areas, raw materials, finished goods and packaging stores and equipment washing areas must, where reasonably practicable, be replaced with suitable alternative materials.

Where replacement is not possible or too costly, a shatter-resistant security film must be applied.

All glass in these areas must be inspected for signs of damage and the results recorded together with any necessary corrective action taken. This includes all glass windows and the internal and external exposed surfaces of any components on machinery e.g. "sight".

This also includes "glass-like" materials, e.g. Perspex or polycarbonate guarding, where it is situated directly on production line equipment. A glass register for this purpose should be maintained.

Glass in food vessels that cannot be replaced due to process pressures/temperatures, must be "toughened" glass.

All light fittings must be protected against damage, including tubes in electronic fly-killing units.

Ingredients shall not be delivered in glass containers unless unavoidable. Such deliveries must be sieved or filtered in a dedicated and separated area as soon as possible after delivery and prior to transfer to production.

Glass bottles, jars, clock faces, mugs, plates and mirrors must not be allowed in any factory areas. Suitable alternative materials are available.

A written breakage procedure must be in place to specify the action to be taken in the event of any breakage.

Any glass breakage on the factory site must be reported immediately to senior site management.

All stock which could have been affected by a glass breakage must be traced, isolated and held. A comprehensive traceability system must be kept readily available. Destroy the affected product.

The area and equipment within a 10 metre radius of any glass breakage must be isolated, searched, all glass fragments removed and disposed of and the equipment thoroughly cleaned, but not with water.

A sample of the glass must be retained for further analysis.

SANS ISO TS 22002-1, 10
CGCSA FSI GMCP B.B 4,
B.C.1

SANS 1678, 6.8
SANS 1679, 6.8
SANS ISO 22002-1, 10.4
CGCSA FSI GMCP B.B 4

When an area has been declared free of contamination a Glass Incident Form must be completed and signed-off to formally 'clear' the area for production.

Any complaint of glass is extremely serious and represents a potential injury. All glass complaints must be immediately followed by a thorough investigation of the incident.

No glass items must to be removed from the laboratory area.

Signage must be available to prevent staff members from taking any glassware into production areas. No glass sampling equipment must be used for sampling.

The use of glass thermometers is prohibited in the production areas.

Glass pH electrodes shall not be used in production areas; samples must be taken to the laboratory for analysis.

UV lights in form fill and seal machines and other packaging equipment must be inspected daily.

The following documentation must be included:

- a. A register per area with records of daily inspections.
- b. Breakage procedures.
- c. A breakage incident form.
- d. A training register and records of training on the policy to familiarise personnel.

8.2 Prevention of contamination by plastic

8.2.1 Raw materials

All hard plastic containers in which raw materials are delivered must be carefully inspected prior to use for any sign of damage. Where necessary, containers must be rejected and the details recorded.

All plastic bags, bag liners or other plastic packaging used for the delivery of raw materials must be coloured to contrast with the product and be a minimum of 65 microns thick (250 gauge) to prevent tearing.

Plastic liners must be completely removed from blocks of butter and fat before any sampling or cutting takes place.

Ingredient bags should be opened with a clean, sharp knife. They must then be carefully disposed of and not reused for any other purpose. Debugging outside the production area is ideal.

Ties and tape should not be used to close plastic liners containing raw materials. Where possible they should be knotted or heat-sealed.

8.2.2 Handling of minor food ingredients

Where plastic bags are used for dispensing weighed-up minor ingredients, e.g. fruit preparations, they must also be coloured to contrast with the product and be a minimum of 65 microns thick.

These must be closed either by loosely knotting the neck or heat sealing. Ties and tape must not be used for this purpose.

These must be opened at the point of use by unknotting.

This should always be the preferred option, or by using a sharp knife. Bags must then be carefully disposed of and not reused.

Small reusable containers must be regularly inspected for damage and replaced where necessary. They should also be washed and allowed to dry after each use.

Particular care must be given to ingredients that are allergens or contain allergens.

8.2.3 Trays and containers for work in progress

When choosing new containers, the maximum loading, likelihood of thermal shock and impact damage, type of stacking to be used and ease of cleaning must be taken into account.

All new containers must be inspected and washed prior to use.

Avoid plastic.

8.2.4 Utensils

Plastic utensils such as scoops, beakers, shovels and mixing paddles must be inspected daily for signs of damage and, where necessary, be discarded and replaced immediately. This must be recorded.

8.2.5 Packaging materials

- a. Suitable precautions must be taken to prevent contamination of products by packaging materials themselves, e.g. breakage of plastic pots, plastic slivers from manufacturing processes.
- b. Where there is a risk that finished product containers may shatter, there must be an agreed documented procedure, which clearly sets out the action to be taken in the event of any such breakage, to prevent product contamination.

8.2.6 Other sources of plastic

Plastic diffusers used to cover light fittings must be kept in good condition and must be on the master cleaning schedule.

Where the use of plastic disposable aprons is unavoidable, they must be coloured and be a minimum of 65 microns thick to prevent easy tearing.

Plastic pallets are preferable, but these should be selected with care to ensure they do not become brittle with time. Regular use in cold stores can render them brittle.

8.3 Prevention of contamination by string/wires, fibre and bristles

Temporary repairs to equipment using strings and wires are not permitted.

Ingredient bags must be opened by cutting with sharp non-tempered steel knives or large scissors. These should be kept in the same place or welded to a chain in the appropriate area. Once the bag is emptied it should be placed directly into a waste container.

All dry ingredients must be sieved before any processing takes place. The correct sieve size must be used for each ingredient and rejected oversize particles must be inspected.

R 146, Annexure D
SANS 10049, 7.4.7
SANS ISO TS 22002-1, 10.3
CGCSA FSI GMCP B.C.2

SANS 10049, 7.3.1.2
SANS ISO TS 22002-1, 8.1,
10.4
CGCSA FSI GMCP B.B.4

SANS ISO TS 22002-1, 10.4
CGCSA FSI GMCP B.B.4, B.C.1

If bags of waste are tied, this should be done with sealing tape of a bright colour. Coloured thread should be used for all stitching.

All containers in which foods or packaging are stored must be kept clean, lidded and in good repair, and must be inspected regularly. Containers showing any sign of damage that could result in possible product contamination must be discarded immediately.

All containers used for food and packaging must be stored off the floor.

Containers used for work in progress should not be covered in polythene sheeting. They should be covered with suitable close-fitting strong plastic or metal lids.

8.4 Prevention of contamination by wood

Cleaning equipment with wooden handles should be avoided at all cost.

If wooden pallets are used, these should be used in dry areas as far as possible and always with a slip sheet.

Wooden shelves used for maturing cheese shall be of solid material, cleaned and well maintained.

IMPORTANT LINKS



HACCP

Remember to refer back to Chapter 1 to recap on the hazards identified and preventive measures in the handling of raw milk and the DVD



DOCUMENTATION

Remember to refer back to Chapter 12 and the DVD for more details on the suggested documentation required for raw milk handling